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THE MARYLAND MANAGEMENT PLAN AND THE ROCK INDUSTRY

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THE MARYLAND MANAGEMENT PLAN AND THE ROCK FISHERY[1]

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A brief explanation of the principles, aims and validity of the Maryland Fishery Management Plan was presented in the first paper of this series. The benefits of such operations to the fish and fishermen were outlined in a general way, without reference to the effect on any one particular species. It will, therefore, be the object of this paper to deal specifically with one fish of commercial importance to Maryland fishermen, and to indicate the effects of correct management on the productivity of that species.

The fish to be dealt with is the rock, or striped bass, one of the State's ranking fish in pound and dollar values. The rivers of Maryland tidewater are the principal nursery areas for this valuable species; consequently the application of sound conservation measures can be expected to realize increased profit to Maryland watermen. Farmers would not oppose measures to conserve the soil from which their livelihood is gained, and the advantages of proper logging procedures should not be questioned by those in the timber business. In fact, natural resources, in general, have shown the need of, and the benefits derived from, proper management programs.

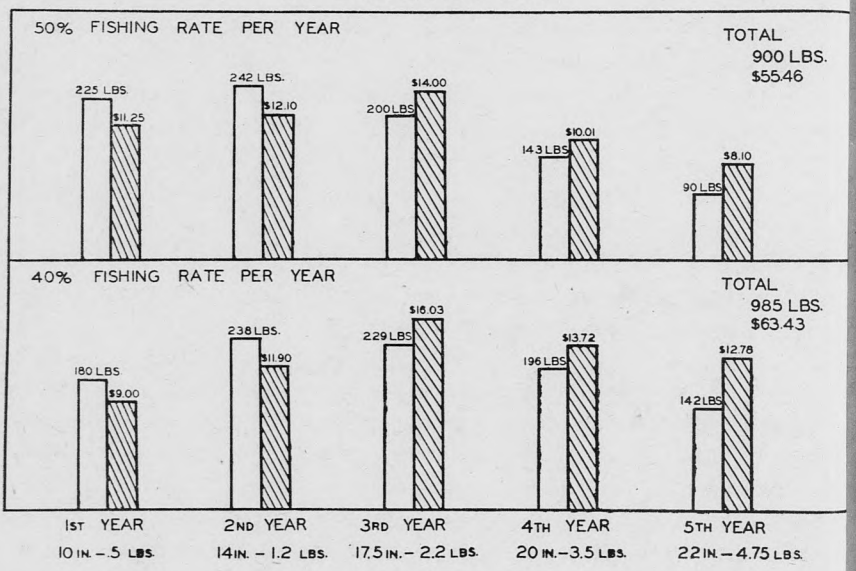
One striking characteristic is present in the rock fishery which sets it apart from nearly all others, and that is its irregularity in yield. The causes of these variations in abundance are not completely understood, but, perhaps as a result of particularly successful spawning, large broods of rock appear in the Chesapeake Bay at intervals of from five to ten years. These large runs are familiar to all Maryland watermen and can very clearly show the effects of a reduced fishing rate, that is to say, a reduction in the number of men fishing.

A particularly large brood of rock was hatched throughout the Bay in 1934. These fish began to appear in the nets in the winter and spring

[1] This is the second of a series of four articles in explanation of Maryland's Fishery Management Plan.

of 1935 and 1936. Their tremendous numbers attracted wide notice, and before long, many men throughout tidewater who ordinarily followed other professions, began setting nets for rock. Storekeepers, barbers, clergymen, blacksmiths, bankers, and even doctors bought or shared fishing gears, and soon glutted the market with barely marketable half-pound fish. As a result, in 1937, the big run was seriously depleted, and in 1938 almost all fish of the brood had been caught. The results of an isolated tagging experiment on yearling fish of this brood give an indication of the tremendously high fishing rate in the Bay during that period. Five hundred fish were tagged and released, each tag bearing instructions for its return. *In nine months, four hundred and fifty tags, ninety per cent of the total number, had been returned.*

THE EFFECT OF DECREASED FISHING RATE ON THE VALUE OF 1000 FISH



Rapid capture of a brood of fish like that just cited is not only poor conservation, it's simply poor business. Let us consider now the comparative yield in pounds and dollars of a brood of rock at different fishing rates. Let us see what would have happened if a larger portion of that population had been allowed to escape during the first fishing season, that is, in 1936

In the accompanying Table, based on actual measurements and weights of rock, and on average prices from Maryland fish dealers, 1,000 fish are used as a theoretical brood for one year, and a natural death rate of 10% is taken into consideration. The terms "50% fishing rate" and "40% fishing rate" simply mean that in each year 50%, or 40%, of the fish population is taken from the water by the fishermen. It might be well to mention at this point that 50% is a very conservative figure for Maryland's rock fishery. The results of tagging experiments and scientific observations over a period of years indicate a much higher rate. Thus if we glance for a moment at the Table, we see that of a brood of 1,000 fish in the Bay at a time when there is a 50% fishing rate and a 10% natural mortality, 450 fish will be caught in the first year, and 100 will die naturally. This will leave 450 for the following year. If, on the other hand, there is a 40% fishing rate instead of 50%, we see that only 360 will be caught in the first year, and 540 will be available in the next year

TABLE

The Effect of Decreased Fishing Rate on the Value of 1,000 Fish.

	1st year	2nd year	3rd year	4th year	5th year
Length	10 in.	14 in.	17.5 in.	20 in.	22 in.
Weight	.5 lbs.	1.2 lbs.	2.2 lbs.	3.5 lbs.	4.75 lbs.
Value per pound	5c	5c	7c	7c	9c
50% Fishing Rate per Year					
Total No. Caught	450	202	91	41	19
Total No. Lbs.	225	242	200	143	90
Total Value	$11.25	$12.10	$14.00	$10.01	$8.10
40% Fishing Rate per Year					
Total No. Caught	360	198	104	56	30
Total No. Lbs.	180	238	229	196	142
Total Value	$ 9.00	$11.90	$16.03	$13.72	$12.78

If we now read from left to right in lines two and three of the Table, the increase in weight and in value of larger fish is seen. The increased values indicated in the Table can be seen in a somewhat different way in the graph following. The comparative values of each year's catch

from the same theoretical brood of 1,000 fish are shown by vertical bars. Since a fish can be caught only once, it would seem far wiser and much more practical for the fisherman to take it at top value. However, a fisherman can't wait until the fish grow to the most valuable size, and then set his nets for them. He must have a *constant* source of income, if he is to continue fishing, and maintain himself and his family. It is in this connection that the Management Plan is most effective. It doesn't require the fisherman to stop fishing. It simply assures him a constant income by making certain that enough of the fish escape to reach the more valuable sizes, both from the viewpoint of income and brood stock. It would spread out a brood like the one hatched in 1934 over a period of 4 or 5 years at steadily increasing value, instead of taking it at its lowest value in one or two years, as had been done in the Bay in the past, a fact well known to Maryland watermen.

When it is considered that 1,000 half-pound fish weigh less than 500 pound-and-a-quarter fish, the logic of a reduced fishing rate can be seen. The fisherman loses nothing by leaving the fish in the water another year. On the contrary, he actually gains. *He fishes no harder for a larger yield.* The only alternative for the Management Plan in Maryland would be to reduce the gear of regular fishermen as well as the unlimited numbers of new fishermen, and make them all work harder and catch fewer fish.

The preceding Table and Graph show the effect of a reduction from 50% to 40% fishing rate. This reduction allows just one-tenth more fish to escape, that is, six out of ten instead of five, and on the basis of only 1,000 fish the increased value in pounds and dollars is readily seen. Multiply that 1,000 fish by many, many hundred thousand more, and an indication of the total increase to the fishery can be seen. Unquestionably, it would amount to many thousands of dollars to the watermen of the State.

The foregoing picture is not pure fancy. It's not just a biologist's dream of what can be done for a fishery. If the rate of decline of the 1940 brood, comparable in size to the 1934 brood discussed previously, is observed, a decided difference is seen. The group hatched in 1940 first appeared in the nets in the fall of 1941. It was not subjected to the same "gold rush" of fishermen as the 1934 brood, and was not fished out as rapidly. It has persisted in noticeably greater numbers, and is at

present appearing as four-pound fish in the spring fishery throughout the Bay. This indicates the increased value possible by reduced fishing.

The principle of fishery management in Maryland is not based on a *reduction* of fishermen or gear. It is simply a *controlled increase* of both men and nets. The idea is not to stop fishermen from operating but to hold their operations at a level which will allow the fish to increase. When the fish increase sufficiently in numbers and poundage, more fishermen will be licensed. However, the licenses will be increased only at a rate which will not hurt the fishermen actually operating at that time, or deplete the supply of fish.

Briefly summing up what has been indicated in this paper, we find that the application of management to the rock fishery *will not cost the fishermen a pound of fish or a dollar of income.* It *will,* on the other hand, take advantage of the years when young rock are particularly abundant, and spread out the "fat years" to last through the "lean years," and result in increased pounds and dollars to the fishermen. It will protect the regular, full-time fishermen from the glutted market, low prices, and years of poor fishing which occur when unlimited numbers of "fair-weather fishermen" are allowed to enter the industry in the years when fish are plentiful.

The benefits of a reduced number of fishermen have already been demonstrated in the increased yield from the 1940 brood discussed previously. Equally important benefits will be obtained from fishery management at the same time in all other kinds of fish in the Bay, resulting in greatly increased yield and income for Maryland's tidewater.